**Before the**
**Federal Communications Commission**
**Washington, D.C. 20554**

| | | |
|---|---|---|
| In the Matter of | ) | MM Docket No. 99-25 |
| | ) | |
| Creation of a | ) | RM-9208 |
| Low Power Radio Service | ) | RM-9242 |

To: The Commission

# COMMENTS OF THE NORTH CAROLINA ASSOCIATION OF BROADCASTERS AND THE VIRGINIA ASSOCIATION OF BROADCASTERS

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August 2, 1999

**Volume 2 of 3**

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*Exhibit Tab*

Exhibit 1

# GRAHAM BROCK, INC.

BROADCAST TECHNICAL CONSULTANTS


**TECHNICAL COMMENTS**
**LOW POWER FM SERVICE**
**NORTH CAROLINA ASSOCIATION OF BROADCASTERS**
**VIRGINIA ASSOCIATION OF BROADCASTERS**
**July 1999**

## TECHNICAL EXHIBIT




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## AFFIDAVIT AND QUALIFICATIONS OF CONSULTANT

*State of Georgia )*
*St. Simons Island ) ss:*
*County of Glynn )*

**JEFFERSON G. BROCK**, being duly sworn, deposes and says that he is an officer of Graham Brock, Inc. Graham Brock has been engaged by North Carolina Association and Virginia Association of Broadcasters to prepare the attached Technical Exhibit.

His qualifications are a matter of record before the Federal Communications Commission. He has been active in Broadcast Engineering since 1979.

The attached report was either prepared by him or under his direction and all material and exhibits attached hereto are believed to be true and correct.

*This the16th day of July, 1999.*

Jefferson G. Brock
*Affiant*

*Sworn to and subscribed before me*
*this the 16th day of July, 1999*

*Notary Public, State of Georgia*
*My Commission Expires: April 20, 2002*

# TECHNICAL COMMENTS
# LOW POWER FM SERVICE
# NORTH CAROLINA ASSOCIATION OF BROADCASTERS
# VIRGINIA ASSOCIATION OF BROADCASTERS
# July 1999

These technical comments and attachments were prepared on behalf of the North Carolina Association of Broadcasters and the Virginia Association of Broadcasters, and are submitted in response to the Commission's Notice of Proposed Rule Making in MM Docket #99-25. The *Notice* proposes the creation of three new low power FM services to be operated in the present FM broadcast band, 88 MHZ to 108 MHz. The proposals involve many technical issues relating to the three proposed classes of stations: the manner in which the new services can be implemented, whether they are to be commercial or non-commercial facilities, whether they will receive protected full service status or be considered a secondary service and whether there will be the potential for interference to the existing FM spectrum.[1]

## GENERAL OVERVIEW

The proposed new services are being considered based on disregarding protection to stations operating on third adjacent channels (600 kHz removed) with additional consideration given to ignoring any 2nd adjacent station protection (400 kHz removed). The LP1000 facility is proposed as a primary service, thus not in danger of being displaced by existing or new full service stations, and taking precedence over existing secondary services. The LP100 facility is also proposed based on disregarding third and possibly 2nd adjacent channel protection requirements. The LP100 would be considered a secondary service. The final class of Low

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1) The three classes proposed specify differing power and height limitations, LP1000 (1,000 watts at 60 meters height above average terrain), LP100 (100 watts at 30 meters height above average terrain) and LP10 (10 watts at 30 meters height above average terrain).

Power FM service, LP10, would be limited to between 1 to 10 watts and is considered a "microradio" service.

The initial proposal allows these new Classes of LPFM stations to be implemented based on a minimum distance separation requirement, in which they cannot deliver interference to existing facilities, but may accept interference. The proposed separations vary based on the classes of the proposed LPFM station and the protected station. It is also proposed to limit the LPFM's emissions and bandwidth to minimize the potential impact of interference to existing facilities.

## CLASS LP1000

The first proposed class of low power service, the LP1000, allows a facility to operate with a maximum effective radiated power of 1000 watts and an antenna height above average terrain not to exceed 60 meters. The very nature of this facility clearly is not low power. The Commission's current rules require that a Class A facility must specifiy at least 100 watts to be considered a Class A facility. The LP1000 stations would have ten times the power of a minimal Class A station. While the height for the LP1000 would be limited to 60 meters (nearly two thirds of a maximum Class A facility), it still is excessive for the proposed service intended by the *Notice*. For example, a LP1000 facility located in the Roanoke area at an existing transmitter site would have a calculated height above average terrain of less than 60 meters (Exhibit A).[2] Yet, in the direction of the population center of Roanoke, the facility would have a 60 dBu contour which extends 22.0 kilometers, which is nearly the referenced distance of the 60 dBu contour of a maximum 3.0 kilowatt Class A facility. This places this facility on an even par with several of the

---

2) The site is the licensed site of station WJLM, Channel 228A, Salem, Virginia, at North Latitude 37° 16' 47" and West Longitude 79° 59' 29".

local Class A stations, with similar coverages (Exhibit B). As the *Notice* points out, the LP1000 facilities that may be proposed within the international coordination zone with both Canada and Mexico must be coordinated as Class A stations.

We have conducted numerous Low Power searches, based on the criteria in the *Notice* (Exhibits E - P). While we used the minimum distance separation requirements, the potential sites used were either existing towers or the city center coordinates of the community in question. The FCC's preliminary evaluation was based on a thirty minute by thirty minute grid (or sixty minute by sixty minute grid). At points where the grids intersected, a search was conducted to establish the number of potential services possible at the location. While this may yield similar results as to the total number of facilities which can be located in a general area, the very nature of the LPFM facility requires the facility be located as close as possible to the population center. As such, the searches were conducted within three miles of the main urban center, or in the heart of the urban center. This is much more representative of the true locations of these facilities' maximum coverage. Our searches of six North Carolina communities and six Virginia communities found limited numbers of potential LP1000 stations, based on the present commercial spacing protections (considering both second and third adjacent protection). As shown on Exhibit C, most communities had no openings for new LP1000 stations. If, however, no third adjacent channel protection is applied, there are potential stations for this class in all but two communities. If second adjacent channel protection is ignored, the number of potentially available LP1000 stations is substantially increased.

While the number of stations increases dramatically as the adjacent channel protections are reduced, the resulting potential for interference increases dramatically as well. Since the LP1000 station would, in many cases, be within the protected contours of the 2nd or 3rd adjacent stations,

there would be the potential for interference within the immediate vicinity of the LP1000 transmitter. While the Commission's *Notice* points out that there have been no reports of interference from grandfathered shortspaced stations as a result of changes in facilities (*Notice* at Paragraph 46), this ignores a very important issue. The shortspacings in question have existed for over thirty years. The stations have never been in a situation where there was no interference from the other station. That is not the case with a proposed new service. A new LP1000 station can and will diminish the full service station's signal within the heart of its protected service contour. While the area(s) may be small, there will be people who can now receive the full service station without any impediments who will experience interference. Even those full service stations currently shortspaced to others would be negatively impacted by the implementation of service of new LP1000 stations in areas which were previously interference free. Further, in many cases, second and third adjacent shortspaced stations' transmitter sites are located further out from the population centers than the potential low power stations would be.[3] When new FM facilities are located within the protected service contours of existing FM facilities, interference has been shown to occur, requiring the offending station to cease operation.[4]

In short, the proposed LP1000 Class of station is not low power. Further, ignoring 2nd and/or 3rd adjacent station minimum spacing is unwise. The resulting increase in interference to existing facilities and loss of service to the public is not in the public interest. Further, extending

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3) Station KJLH, Compton, California (BPH-920731IH), is located in the Baldwin Hills Park area and is shortspaced to two second adjacent stations: KIIS-FM, Los Angeles, and KSCA, Glendale, California. The interference to these facilities is within the blanketing contour of KJLH and does not extend beyond the park.

4) An on-channel FM booster for station WOVA, Deruyter, New York, was located within the 54 dBu protected contour of a second adjacent station located near a residential area and adjacent to a major thoroughfare. When the booster commenced operation, the second adjacent station received numerous complaints from persons using a variety of different radios. The booster was ordered to cease operation as a result of the actual interference to the second adjacent station.

protected status to these facilities, based on the startup cost of this size of facility, is misplaced. The potential operator of the new service, as sought by the *Notice*, has limited or no experience in the broadcast field. The ability to electronically submit an application, obtain a permit and construct a facility is burdensome, not only for existing broadcasters, but also for the Commission's Compliance Bureau. Using antiquated or bargain basement equipment will quite likely result in out of band emissions and interference beyond the adjacent channels, causing increased interference to other services (not only existing broadcast facilities).

The cost of low power FM service, if LP1000 facilities were to be considered low power, is substantially less than the cost of the comparable service in television. A low power FM transmitter in the five hundred watt range with a two bay antenna system would require an investment of less than $20,000, whereas a low power television transmitter and antenna system can easily exceed $100,000. Why, then, is low power TV not protected, since the investment is five times as much as its low power FM counterpart? The LP1000 class of station should not be considered.

## CLASS LP100 AND MICRORADIO

The proposed LP100 class of station (and less powerful microradio) is also likely to have a substantial impact on existing service. A search of the same twelve communities (as denoted above) revealed the availability of LP100 stations at all but two sites when full protection is given existing full service stations (the less powerful micro stations would likewise have more available channels than the LP1000 stations). While the same LP100 stations might locate to maximize their coverage in the center of the area they would seek to serve, the potential interference impact on existing services would still occur. Interference would still occur, albeit restricted to close proximity to the low power transmitter site. The search for LP100 stations reveals more potential

frequencies if the third adjacent channels are not protected, and even more facilities are possible if the 2nd adjacent channels are not protected (see Exhibit D). Because the number of potential LP100 stations available with the provision of full protection to stations (co-, 1st, 2nd and 3rd adjacent) is substantial, the removal of 2nd and 3rd adjacent channel protection is not warranted.

If the Commisison deems the LP100 service to be viable, it should be required to provide protection to all full service stations, as well as existing auxiliary services, and be considered a secondary service. New low power stations should not be allowed to displace existing translators, nor should the implementation of a new translator be precluded by the low power facility. If deemed a viable service, LP100 stations should be authorized solely on a protection from interference basis, rather than be implemented on a spacing basis, as FM translators. Further, if actual interference occurs to adjacent or non-adjacent broadcast stations or other services, operation of the low power station should cease.

## LIMITED BANDWIDTH AND EMISSIONS

The *Notice* proposed limits to bandwidth and emissions to offset the potential impact on 2nd adjacent channel interference. As noted above, there is no need to eliminate 2nd and 3rd adjacent channel protection, mooting the need for such limitations. However, should the Commission deem 2nd and/or 3rd adjacent protection unnecessary, contrary to the Comments submitted herein, there is a need for limited spectral emissions to guard against low power FM intrusion into existing FM services or potential IBOC digital services. While the Commission would desire to implement low power FM service on a cost effective basis for the new entrants, limits which are more restrictive than the present FM service would be necessary and new equipment with the tighter emission limits should be employed. While low power operators could utilize existing (used) broadcast equipment to initiate services, the purchase of newer equipment

would be necessary to limit any impact to adjacent channel stations. Similarly, a reduced bandwidth for low power FM facilities to limit 2nd adjacent channel impacts is likewise mooted, if protection to 2nd and 3rd adjacent channels is maintained. However, if 2nd and 3rd adjacent channel protections are eliminated, a reduction in bandwidth would be necessary, requiring new, or changes to existing, equipment to allow the implementation of low power FM stations. If the low power FM service is to be considered viable and competitive to the audio fidelity of existing FM broadcast service, different emission requirements and bandwidth restrictions would help limit any impact to existing services if 2nd or 3rd adjacent channel protection is removed.

# TECHNICAL COMMENTS
# LOW POWER FM SERVICE
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## EXHIBIT A

Predicted Signal Contours:

37 16 47 - TABULATED SERVICE CONTOUR FOR LP1000 ROANOKE, VIRGINIA
79 59 29 - USING WJLM SITE AS REFERENCE

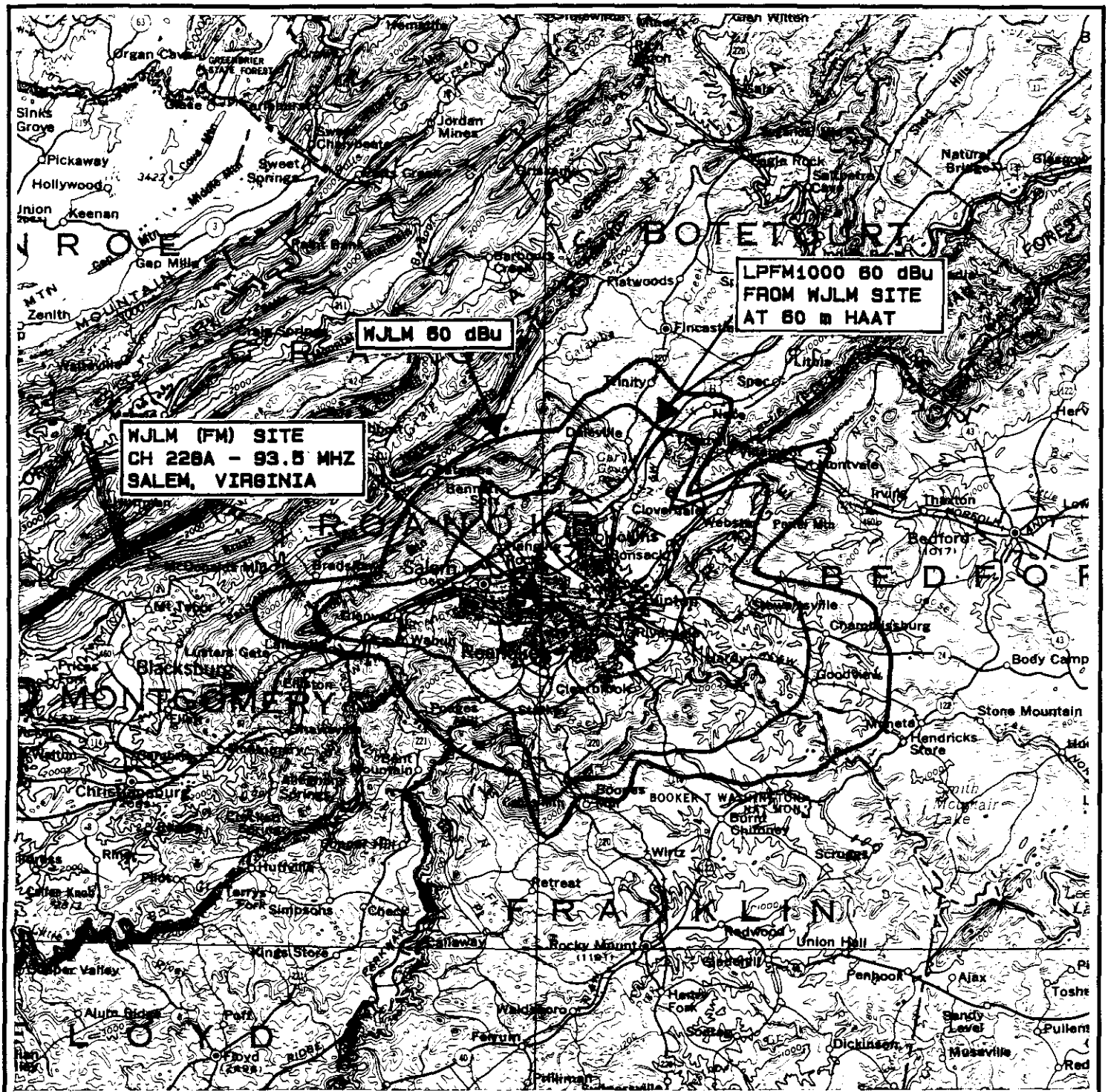
ERP = 1 kW, 0 dBk FM - 2-6 Tables 03 Sec

| Radial | HAAT | kW | dBk | Field | 60 dBu.5 |
|---|---|---|---|---|---|
| 0 Degs. | 29.5M | 1.000 | 0.000 | 1.000 | 10.2 |
| 10 Degs. | 83.8M | 1.000 | 0.000 | 1.000 | 16.8 |
| 20 Degs. | 106.2M | 1.000 | 0.000 | 1.000 | 19.2 |
| 30 Degs. | 98.3M | 1.000 | 0.000 | 1.000 | 18.4 |
| 40 Degs. | 111.0M | 1.000 | 0.000 | 1.000 | 19.7 |
| 50 Degs. | 55.2M | 1.000 | 0.000 | 1.000 | 13.6 |
| 60 Degs. | 140.4M | 1.000 | 0.000 | 1.000 | 21.9 |
| 70 Degs. | 104.8M | 1.000 | 0.000 | 1.000 | 19.1 |
| 80 Degs. | 78.9M | 1.000 | 0.000 | 1.000 | 16.2 |
| 90 Degs. | 143.7M | 1.000 | 0.000 | 1.000 | 22.1 |
| 100 Degs. | 160.8M | 1.000 | 0.000 | 1.000 | 23.3 |
| 110 Degs. | 169.0M | 1.000 | 0.000 | 1.000 | 23.9 |
| 120 Degs. | 141.3M | 1.000 | 0.000 | 1.000 | 22.0 |
| 130 Degs. | 114.0M | 1.000 | 0.000 | 1.000 | 19.9 |
| 140 Degs. | 87.2M | 1.000 | 0.000 | 1.000 | 17.2 |
| 150 Degs. | 71.3M | 1.000 | 0.000 | 1.000 | 15.4 |
| 160 Degs. | 81.4M | 1.000 | 0.000 | 1.000 | 16.5 |
| 170 Degs. | 76.3M | 1.000 | 0.000 | 1.000 | 15.9 |
| 180 Degs. | 92.2M | 1.000 | 0.000 | 1.000 | 17.8 |
| 190 Degs. | 50.3M | 1.000 | 0.000 | 1.000 | 13.0 |
| 200 Degs. | -34.6M | 1.000 | 0.000 | 1.000 | 10.2 |
| 210 Degs. | -16.1M | 1.000 | 0.000 | 1.000 | 10.2 |
| 220 Degs. | 4.9M | 1.000 | 0.000 | 1.000 | 10.2 |
| 230 Degs. | -28.9M | 1.000 | 0.000 | 1.000 | 10.2 |
| 240 Degs. | -105.0M | 1.000 | 0.000 | 1.000 | 10.2 |
| 250 Degs. | 44.3M | 1.000 | 0.000 | 1.000 | 12.2 |
| 260 Degs. | 103.7M | 1.000 | 0.000 | 1.000 | 19.0 |
| 270 Degs. | 126.9M | 1.000 | 0.000 | 1.000 | 20.9 |
| 280 Degs. | 44.8M | 1.000 | 0.000 | 1.000 | 12.3 |
| 290 Degs. | -11.2M | 1.000 | 0.000 | 1.000 | 10.2 |
| 300 Degs. | -8.7M | 1.000 | 0.000 | 1.000 | 10.2 |
| 310 Degs. | -40.9M | 1.000 | 0.000 | 1.000 | 10.2 |
| 320 Degs. | 20.5M | 1.000 | 0.000 | 1.000 | 10.2 |
| 330 Degs. | 47.0M | 1.000 | 0.000 | 1.000 | 12.6 |
| 340 Degs. | -9.1M | 1.000 | 0.000 | 1.000 | 10.2 |
| 350 Degs. | 27.7M | 1.000 | 0.000 | 1.000 | 10.2 |

Ave. HAAT= 60.0M, Ant. COR= 472.5M AMSL

[redacted]

B




## 60 dBu CONTOURS

MAP IS A PORTION OF THE 1:500,000 SCALE
U.S.G.S. BASE STATE MAP OF VIRGINIA

SCALE 1:500,000

MI 10 0 10 MI

KM 10 0 10 KM

EXHIBIT #B

TECHNICAL COMMENTS
LOW POWER FM SERVICE
NORTH CAROLINA ASSOCIATION
& VIRGINIA ASSOCIATION
OF BROADCASTERS

July 1999

GRAHAM BROCK, INC.

BROADCAST TECHNICAL CONSULTANTS

[redacted]

C

# TECHNICAL COMMENTS
# LOW POWER FM SERVICE
# NORTH CAROLINA ASSOCIATION OF BROADCASTERS
# VIRGINIA ASSOCIATION OF BROADCASTERS
# July 1999

## EXHIBIT C

### Number of Potentially Available LP1000 Stations[5]

*North Carolina and Virginia*

| City/Site | Number of stations if FULL 2nd and 3rd adjacent channel interference protection | Number of stations if NO 3rd adjacent channel interference protection | Number of stations if NO 2nd and 3rd adjacent channel interference protection |
|---|---|---|---|
| *Charlotte, NC* | | | |
| FCC | 0 | 0 | 3 |
| City Center | 0 | 2 | 9 |
| *Greenville, NC* | | | |
| FCC | 2 | 3 | 5 |
| Farmville Tower | 1 | 2 | 9 |
| *Hope Mills, NC* | | | |
| WCCG Tower | 1 | 4 | 9 |
| *Louisburg, NC* | | | |
| WYRN Tower | 4 | 7 | 13 |
| *Raleigh, NC* | | | |
| FCC | 0 | 0 | 3 |
| *Roxboro, NC* | | | |
| WKRX Tower | 0 | 1 | 6 |
| *Charlottesville, VA* | | | |
| WQMZ Tower | 3 | 5 | 10 |
| *Gloucester, VA* | | | |
| WXGM Tower | 1 | 2 | 6 |
| *Manassas, VA* | | | |
| WJFK Tower | 0 | 0 | 0 |
| *Richmond, VA* | | | |
| FCC | 3 | 8 | 18 |
| WJRV Tower | 0 | 4 | 11 |
| *Roanoke, VA* | | | |
| City Center | 2 | 5 | 12 |
| *Staunton, VA* | | | |
| City Center | 3 | 6 | 16 |

5) Data based on studies conducted between 4-7-99 and 7-14-99.

[redacted]

D

**TECHNICAL COMMENTS**
**LOW POWER FM SERVICE**
**NORTH CAROLINA ASSOCIATION OF BROADCASTERS**
**VIRGINIA ASSOCIATION OF BROADCASTERS**
**July 1999**

## EXHIBIT D

### Number of Potentially Available LP100 Stations[6]

*North Carolina and Virginia*

| City/Site | Number of stations if FULL 2nd and 3rd adjacent channel interference protection | Number of stations if NO 3rd adjacent channel interference protection | Number of stations if NO 2nd and 3rd adjacent channel interference protection |
|---|---|---|---|
| *Charlotte, NC* | | | |
| FCC | 1 | 1 | 13 |
| City Center | 2 | 7 | 18 |
| *Greenville, NC* | | | |
| FCC | 6 | 7 | 12 |
| Farmville Tower | 5 | 7 | 17 |
| *Hope Mills, NC* | | | |
| WCCG Tower | 3 | 12 | 18 |
| *Louisburg, NC* | | | |
| WYRN Tower | 4 | 11 | 20 |
| *Raleigh, NC* | | | |
| FCC | 0 | 1 | 9 |
| *Roxboro, NC* | | | |
| WKRX Tower | 1 | 6 | 18 |
| *Charlottesville, VA* | | | |
| WQMZ Tower | 5 | 12 | 22 |
| *Gloucester, VA* | | | |
| WXGM Tower | 5 | 8 | 15 |
| *Manassas, VA* | | | |
| WJFK Tower | 0 | 0 | 6 |
| *Richmond, VA* | | | |
| FCC | 8 | 24 | 59 |
| WJRV Tower | 2 | 5 | 18 |
| *Roanoke, VA* | | | |
| City Center | 3 | 8 | 20 |
| *Staunton, VA* | | | |
| City Center | 5 | 10 | 22 |

6) Data based on studies conducted between 4-7-99 and 7-14-99.

[redacted]

E

**TECHNICAL COMMENTS**
**LOW POWER FM SERVICE**
**NORTH CAROLINA ASSOCIATION OF BROADCASTERS**
**VIRGINIA ASSOCIATION OF BROADCASTERS**
**July 1999**

## EXHIBIT E

## LP1000 and LP100 CRITERIA USED FOR LOW POWER FM SEARCHES

We have conducted eleven low power FM searches, utilizing an existing transmitter site where possible, for each of the various communities. Both a 1.0 kilowatt, 60 meter LP1000 search and 100 watt, 30 meter LP100 search were conducted from each specific location. Only full service FM stations were considered.

The individual searches were conducted based on the Commission's proposed minimum distance separation requirements for the respective class of low power FM stations. We used the more liberal spacing/reception of interference requirements, wherein the low power facilities cannot deliver interference to existing stations but can receive it, potentially enabling additional low power stations. The two individual Class L1 and L2 preclusionary studies for each community are attached (as Exhibits F - P). The individual preclusionary studies show all precluding co-, 1st, 2nd and 3rd adjacent stations. From these prospective lists, we then determined the potentially available frequencies for each class of station. Where appropriate, we did not consider 2nd and/or 3rd adjacent stations as precluding new low power FM facilities to determine the total number of stations possibly based on full protection, protecting co-, 1st and 2nd adjacent stations and protecting only co- and 1st adjacent stations.

# CLASS LP1000

Assuming 1000 watt effective radiated power (ERP)
at 60 meters antenna height above terrain (HAAT)
60 dBu F(50,50) protected contour extends 14.2 km

MINIMUM DISTANCE SEPARATION (KM) NECESSARY TO:
CAUSE NO OVERLAP/RECEIVE NO OVERLAP

| Channel Class | co- | 1st- | 2nd- reserved band | 2nd-/3rd- commercial band | IF |
|---|---|---|---|---|---|
| A | 79/101 | 50/58 | 33/23 | 31/17 | 7 |
| C3 | 90/128 | 60/74 | 44/27 | 41/18 | 9 |
| B1 | 105/128 | 70/74 | 50/27 | 46/18 | 9 |
| C2 | 103/152 | 73/92 | 57/34 | 54/20 | 13 |
| B | 137/152 | 95/92 | 71/34 | 67/20 | 13 |
| C1 | 123/186 | 94/119 | 77/48 | 75/24 | 20 |
| C | 143/212 | 113/151 | 96/65 | 94/28 | 28 |
| D | 56/32 | 27/22 | 10/16 | 8/15 | 4 |
| Other LP1000 | 65 | 35 | | | |

CLASS LP1000
WITHIN 320 KM OF THE CANADIAN BORDER

| Channel Class | co- | 1st- | 2nd- | 3rd- | IF |
|---|---|---|---|---|---|
| A1(.25/100) | 90/58 | 48/33 | 25/18 | 21/15 | 4 |
| A(6/100) | 111/101 | 69/58 | 45/23 | 41/17 | 7 |
| B1(25/100) | 123/128 | 81/74 | 57/27 | 53/18 | 9 |
| B(50/150) | 137/152 | 95/92 | 71/34 | 67/20 | 12 |
| C1(100/300) | 158/186 | 116/119 | 93/48 | 89/24 | 20 |
| C(100/600) | 154/212 | 120/151 | 102/65 | 98/28 | 28 |

EXHIBIT E1
TECHNICAL COMMENTS
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CLASS LP1000
WITHIN 320 KM OF MEXICAN BORDER

| Channel Mexican Class | co- | 1st- | 2nd-/3rd- | IF |
|---|---|---|---|---|
| A(3/100) | 75/90 | 45/51 | 26/16 | 6 |
| AA(6/100) | 79/101 | 49/58 | 31/17 | 7 |
| B1(25/100) | 105/128 | 70/74 | 46/18 | 9 |
| B(50/150) | 137/152 | 95/92 | 67/20 | 12 |
| C1(100/300) | 123/186 | 94/119 | 75/24 | 20 |
| C(100/600) | 143/212 | 113/151 | 94/28 | 28 |

# CLASS LP100

Assuming 100 watts effective radiated power (ERP)
at 30 meters antenna height above terrain (HAAT)
60 dBu F(50,50) protected contour extends 5.2 km
MINIMUM DISTANCE SEPARATION (KM) NECESSARY TO:
CAUSE NO OVERLAP/RECEIVE NO OVERLAP

| Channel Class | co- | 1st- | 2nd- reserved band | 2nd-/3rd- commercial band | IF |
|---|---|---|---|---|---|
| A | 47/92 | 36/49 | 30/15 | 29/8 | 7 |
| C3 | 58/119 | 47/66 | 41/19 | 40/10 | 9 |
| B1 | 67/119 | 54/66 | 47/19 | 46/10 | 9 |
| C2 | 71/143 | 60/84 | 54/26 | 53/12 | 12 |
| B | 92/143 | 77/84 | 68/26 | 67/12 | 12 |
| C1 | 91/178 | 80/111 | 74/39 | 73/16 | 20 |
| C | 110/203 | 100/142 | 93/56 | 93/19 | 28 |
| D | 24/23 | 13/13 | 7/7 | 6/6 | 4 |
| Other LP100 | 24 | 14 | | | |

CLASS LP100 WITHIN 320 KM OF THE CANADIAN BORDER

| Channel Canadian Class | co- | 1st- | 2nd- | 3rd- | IF |
|---|---|---|---|---|---|
| A1(.25/100) | 45/50 | 30/25 | 21/10 | 20/7 | 4 |
| A(6/100) | 66/92 | 50/49 | 41/15 | 40/8 | 7 |
| B1(25/100) | 78/119 | 62/66 | 53/19 | 52/10 | 9 |
| B(50/150) | 92/143 | 76/84 | 68/26 | 66/12 | 12 |
| C1(100/300) | 113/178 | 98/111 | 89/39 | 88/16 | 19 |
| C(100/600) | 118/203 | 106/142 | 99/56 | 98/19 | 28 |

EXHIBIT E2
TECHNICAL COMMENTS
LOW POWER FM SERVICE
NORTH CAROLINA ASSOCIATION
& VIRGINIA ASSOCIATION
OF BROADCASTERS
July 1999

CLASS LP100WITHIN 320 KM OF MEXICAN BORDER

| Channel<br>Mexican Class | co- | 1st- | 2nd-/3rd- | IF |
|---|---|---|---|---|
| A(3/100) | 43/82 | 32/42 | 25/8 | 5 |
| AA(6/100) | 47/92 | 36/49 | 29/8 | 6 |
| B1(25/100) | 67/119 | 54/66 | 45/10 | 8 |
| B(50/150) | 91/143 | 76/84 | 66/12 | 11 |
| C1(100/300) | 91/178 | 80/111 | 73/16 | 19 |
| C(100/600) | 110/203 | 100/142 | 92/19 | 27 |

F